PC-486HU(PC)-LV

CPU CARD WITH VGA, LAN, SSD

User's Manual

CONTEC

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Product Configuration

- Board (PC-486HU(PC)-LV)---1
- User's Guide (this booklet)---1
- HDD cable---1
- FDD cable---1
- COM x 1, Printer x 1 connector cable---1
- 5-pin (DIN) →6-pin (MINI DIN) conversion cable---1
- Floppy disks (drivers)---3
- Jumper short pins---16
- Spacers---2
- Nuts---2
- Form "Before Using the IPC"---1

Unpacking:

This board is specially packed in an anti-static bag to prevent damage in shipping.

Check the contents to make sure that you have everything listed above. If you do not have all the items, contact your distributor or CONTEC group office where you purchased.

Note!

Do not remove the board from its protective packaging until the computer case is open and ready for installation. Electrical static can cause damage to electrical components.

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1. Introduction

Thank you for choosing the PC-486HU(PC)-LV.
This board is equipped with enhanced VGA and LAN functions and is fully compatible with the PC/AT computer. With faster processing speed and increased extensibility, the board can handle more tasks than ever. Please read this guide carefully before connecting the board with external devices or building a system.

Limited Three-Year Warranty

CONTEC Interface boards are warranted by CONTEC Co., LTD. to be free from defects in material and workmanship for up to three years from the date of purchase by the original purchaser.

Repair will be free of charge only when this device is returned freight prepaid with a copy of the original invoice and a Return Merchandise Authorization to the distributor or the CONTEC group office, from which it was purchased.

This warranty is not applicable for scratches or normal wear, but only for the electronic circuitry and original boards. The warranty is not applicable if the device has been tampered with or damaged through abuse, mistreatment, neglect, or unreasonable use, or if the original invoice is not included, in which case repairs will be considered beyond the warranty policy.

How to Obtain Service

For replacement or repair, return the device freight prepaid, with a copy of the original invoice. Please obtain a Return Merchandise Authorization Number (RMA) from the CONTEC group office where you purchased before returning any product.

*** No product will be accepted by CONTEC group without the RMA number.**

Liability

The obligation of the warrantor is solely to repair or replace the product. In no event will the warrantor be liable for any incidental or consequential damages due to such defect or consequences that arise from inexperienced usage, misuse, or malfunction of this device.

Handling Precautions

Take the following precautions when handling this board.

- Do not strike or bend the board. Doing so could damage the board.
- Do not modify the board. CONTEC will bear no responsibility for any problems, etc., resulting from modifying this board.
- Do not touch the board's metal plated terminals (edge connector) with your hands. Doing so could cause connection malfunctions. If the terminals are touched by someone's hands, clean the terminals with industrial alcohol.
- There are switches on the board that need to be set in advance. Be sure to check these before installing the board.
- Only set the switches and jumpers on the board to the specified settings. Doing otherwise would cause trouble.
- Install the board in the computer's PCI expansion slot.
- Do not install or remove the board to or from the slot while the computer's power is turned on. Doing so could cause trouble. Be sure that the personal computer or the I/O expansion unit power is turned off.
- The sum of the power consumed by the boards installed in the personal computer's PCI bus expansion slots cannot be larger than the personal computer's allowable power supply capacity. If the boards' power sum is larger than this capacity, trouble could occur.

About the Manual

This manual consists of the following chapters:

Chapter 1 Introduction

Chapter 2 System Reference
Describes the system specifications and provides information on how to protect the built-in CPU board from damage.

Chapter 3 Description of Hardware
Identifies component locations and provides the overview of their functions. The end of this chapter provides information on how to set jumpers and how to set up the board according to specific needs.

Chapter 4 Software Utilities
Describes the VGA driver in detail as well as the LAN driver that comes with this board. Watchdog timer functions are also described briefly.

Chapter 5 Green PC Function
Describes the Green PC function in detail.

Chapter 6 Award BIOS Setup
Describes how to set up the BIOS.

Chapter 7 Appendix
Describes the expansion bus, technical summary, and troubleshooting.

2. System Reference

Specifications

Functional Specifications ***< 1 / 2 >***

Item	Specification
CPU	AMD 5X86 133MHz
Memory (optional)	Max. 128MB DRAM 72-pin SIMM socket x 2 EDO/FPM
Cache	L1 cache: 16 KB L2 cache: 128KB
Real time clock/calendar	Dallas DS 12887 real time clock Backs up CMOS data by BIOS settings. (Battery life: Approx. 10 years)
BIOS	Award Flash BIOS, Plug and Play-compatible 128KB flash EEPROM Green function, Supports S/IO setup
Keyboard/mouse connector	MINI DIN connector: Compatible with the PC/AT keyboard or PS/2 mouse 5-pin connector: Compatible with an external PC/AT keyboard
Supported bus	External ISA bus (Internal PCI bus: Used by VGA and IDE)
SSD socket	32-pin SSD onboard socket x 1 Supports up to 144MB DiskOnChip by M-Systems
VGA	Intel's C&T 65550 (VRAM 1MB built in) 32-bit PCI local bus connection CRT/LCD-compatible, Simultaneous output capability (TFT/STN-compatible) Video BIOS, compatible with 1,024x768XGA, 800x600SVGA, and 640x480VGA LCDs, is stored in the system BIOS. CRT connector VGA-compatible, 15-pin MINI D-SUB x1 LCD connector 41-pin DF9-41P-1V(22) by HIROSE x 1
Watchdog	I/O port 443H: Enable watchdog I/O port 441H: Disable watchdog Expiration timing: Choose from 0/8/16/24/32/40/48/56/64/72/80/88/96/104/112/120 sec. (+/-25%)
IDE interface	IDE port x 1 (Supports two expansion IDE devices) 40-pin, 2.54mm-pitch pin header connector x 1
FDD interface	Floppy disk drive: 3.5inch/5.25inch Supports two (360K/720K/1.2M/1.44M/2.88M) drives 34-pin, 2.54mm-pitch pin header connector x 1
LAN interface	MX-98715A high-speed Ethernet 100/10BASE-T by Macronix (Hardware disconnection of the LAN interface is not allowed.) RJ-45 connector x 1, LED indicator LINK/ACT
Serial port	High-speed 16550-compatible UART x 2, with 16-byte transmission/reception FIFO COM1: RS-232C, COM2: RS-232C/422/485-compatible Programmable baud rate generator 10-pin, 2.54mm-pitch pin header connector x 1 9-pin D-SUB connector (male) x 1
Parallel port	SPP-, ECP-, and EPP-compatible, bi-directional parallel port 26-pin, 2.54mm-pitch pin header connector x 1

Functional Specifications *< 2 / 2 >*

Item	Specification
Green function	Support by software: by BIOS setup Support by hardware: Switch control
LED indicator	System power supply Access to hard disk Turbo and green function modes
DMA controller	82C37×2
DMA channel	7
Interrupt controller	82C59×2
Interrupt levels	15

General Specifications

Item	Specification
Current consumption	5VDC, 5A Max. 12VDC, 200mA Max.
Storage temperature	-40 to 80°C
Operating temperature	0 to 60°C
Humidity	20 to 80%(Non-condensing)
System power requirements	DC: +5V(+4.75 to +5.25V), DC: 5A DC: +12V(+11.4 to +12.6V), DC: 200mA
External dimensions (mm)	185(L)×122(W)
Weight	250g

Safety Precautions

In order to protect the system from damage, take the following precautions:

- Always protect the system from static electricity.
- Take care to avoid electrical shock hazard. When the card is powered, do not touch any part of it. When the system is not in use, always switch off the system.
- Before replacing any hardware device, switch off the system or current surge may damage the corresponding electronic component or the entire system when connecting jumpers or installing cards.

Identification of Board Components

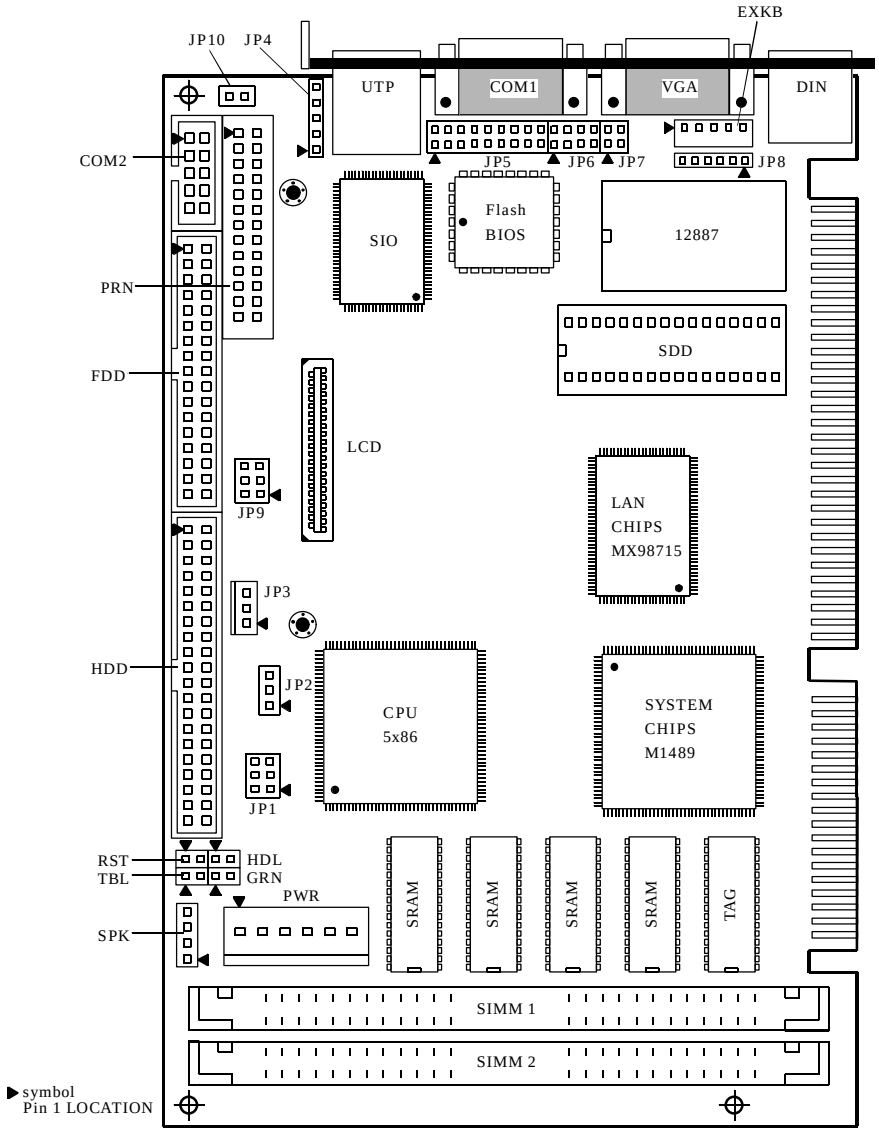


Figure 2.1. Component identification

3. Description of Hardware

This chapter describes jumper and connector settings in detail and identifies the location of each component.

Table 3.1. Quick reference table (Jumpers and connectors)

Turbo LED connector	TBL
Hard disk drive's LED connector	HDL
Reset connector	RST
External speaker connector	SPK
Power supply LED and key lock connector	JP4
Green function connector	GRN
RS232C/422/485 (COM2) selection	JP5
Keyboard and PS/2 mouse selection	JP8, JP10
DIN connector (for keyboard or PS/2 mouse)	DIN
Hard disk drive connector	HDD
Floppy disk connector	FDD
Printer connector	PRT
LCD panel connector	LCD
VGA CRT connector	VGA
External keyboard connector	EXKB
COM1 connector	COM1
COM2 connector	COM2
Panel type selection	JP1
Panel power supply connector	JP3
Semiconductor disk socket	SSD
SSD memory map selection	JP6, JP7
Power supply connector	PWR
LAN connector	UTP
Panel VCC selection	JP2
Memory installation	SIMM1, SIMM2
Watchdog selection	JP9

Jumper Setup Procedure

Setting up jumpers allows you to configure the board. A jumper consists of two or three metal pins and installed on a plastic base on the board. These pins are connected with a small plastic "cap (containing a metal contact)". The hardware is configured by either "opening" or "closing" between pins.

A series of jumpers may be organized into a group to form a "jumper block". If all jumpers are located in a jumper block, the group of jumpers need to be set as a group to configure the hardware. The following figure illustrates this.

Jumpers and Caps

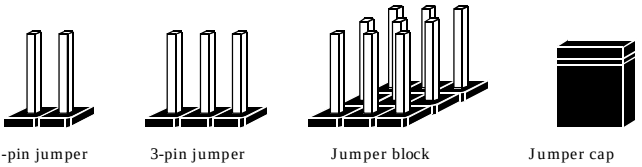


Figure 3.1. Jumpers and caps

Suppose there is a jumper consisting of three pins (pins 1, 2, and 3, for example). Connecting pin 1 with pin 2 enables you to achieve one setting leaving one pin unconnected. Connecting pins 2 and 3 enables you to achieve another setting. The jumper illustrations shown below will be used throughout this guide. These illustrations enable you to understand the figures in this guide and what they represent.

Jumper Illustrations

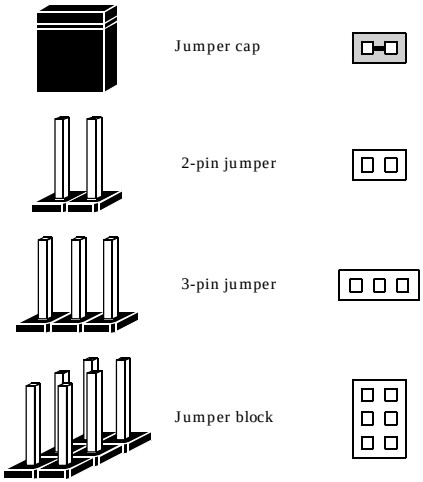


Figure 3.2. Jumper illustrations

Jumper Settings

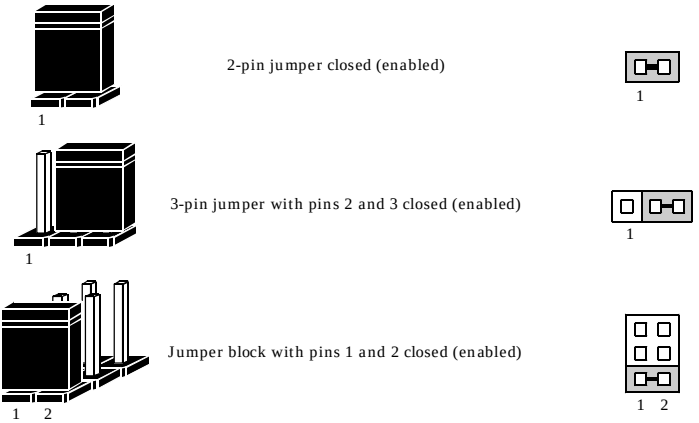
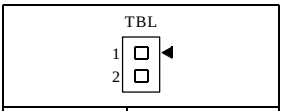

2-pin jumper closed (enabled)
1
3-pin jumper with pins 2 and 3 closed (enabled)
1
Jumper block with pins 1 and 2 closed (enabled)
1 2

Figure 3.3. Jumper settings

Description of Jumpers and Connectors

TBL: Turbo LED Connector

Table 3.2. Turbo LED connector



Compatible connector: HKP-2FSA01 (2.54mm-pitch, 2.54mm-thick)

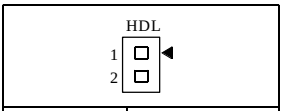
Compatible socket contact: HKP-F613B AWG#24-28

Manufacturer: HONDA

Pin No.	Function
1	Vcc
2	Turbo Signal

HDL: Hard Disk Drive's LED Connector

Table 3.3. Hard disk drive's LED connector



Compatible connector: HKP-2FSA01 (2.54mm-pitch, 2.54mm-thick)

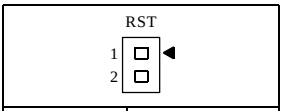
Compatible socket contact: HKP-F613B AWG#24*28

Manufacturer: HONDA

Pin No.	Function
1	HDD Active Signal
2	Vcc

RST: Reset Connector

Table 3.4. Reset connector



Compatible connector: HKP-2FSA01 (2.54mm-pitch, 2.54mm-thick)

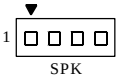
Compatible socket contact: HKP-F613B AWG#24*28

Manufacturer: HONDA

Pin No.	Function
1	Reset
2	GND

SPK: External Speaker Connector

Table 3.5. External speaker connector



Compatible connector: HKP-4FSA01 (2.54mm-pitch, 2.54mm-thick)

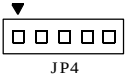
Compatible socket contact: HKP-F613B AWG#24*28

Manufacturer: HONDA

Pin No.	Function
1	Vcc
2	GND
3	N.C.
4	Speaker Signal

JP4: Power Supply LED and Key Lock Connector

Table 3.6. Power supply LED and key lock connector



Compatible connector: HKP-3FSA01 or HKP-2FSA01

Compatible socket contact: HKP-F613B AWG#24*28

Manufacturer: HONDA

Pin No.	Function
1	Power LED
2	N.C.
3	GND
4	Keyboard INT
5	GND

GRN: Green Function Connector

This connector is for an external LED and indicates the power conservation state when the Green PC function is in use.

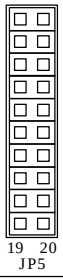
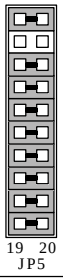
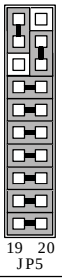
Table 3.7. Green function connector

Pin No.	Function
1	Green Signal
2	GND

JP5: COM2 (RS-232C/422/485 selection)

COM1 can be used only for the RS-232-C function.
COM2 allows the RS-232-C, 422 or 485 function to be selected.

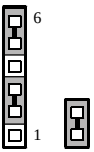
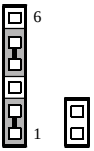
Table 3.8. COM2

COM2 Function	RS-232C JP5	RS-422 JP5	RS-485 JP5
Jumper setting (pin closed)	Open	1-2 5-6 7-8 9-10 11-12 13-14 15-16 17-18 19-20	1-3 4-6 7-8 9-10 11-12 13-14 15-16 17-18 19-20
Jumper illustration			

*Factory setting: RS-232C

JP8 and JP10: AT Keyboard and PS/2 Mouse Selection

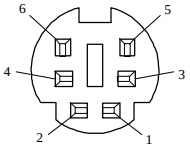
Table 3.9. AT keyboard and PS/2 mouse selection

Type	Jumper setting (Pins closed) JP8	JP10	Jumper illustration
PS/2 MOUSE	2-3 5-6	Close	
AT KEYBOARD	1-2 4-5	Open	

*Factory setting: AT Keyboard

DIN: MINI DIN Connector (for the Keyboard or PS/2 mouse)

Table 3.10. DIN connector



Pin No.	Function	
	Keyboard	PS/2 Mouse
1	KB DATA	MS DATA
2	N.C.	N.C.
3	GND	GND
4	V_{CC}	V_{CC}
5	KB CLK	MS CLK
6	N.C.	N.C.

Pin No., Function

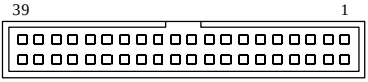
In order to use a keyboard when this connector is set up for the "PS/2 mouse", you need to use the EXternal KeyBoard (EXKB) connector (see page 20).

Procedure 1 Use the optional cable (PS/2 connector cable). The optional cable attached with an L-shaped metal fixture enables you to take out the PS/2 (6-pin MINI DIN) keyboard connector from the EXKB connector to the case scuttle.

Procedure 2 If there is a (5-pin) DIN keyboard connector on the backplane or a DIN connector on the backplane board, connect the keyboard to the backplane using an EXKB connector cable (normally attached to the rack side).

HDD: Hard Disk Driver Connector

Table 3.11. Hard disk driver connector



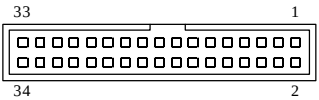
HDD

Pin No.	Function	Pin No.	Function
1	REST	2	GND
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11
11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
19	GND	20	N.C.
21	N.C.	22	GND
23	IOW	24	GND
25	IOR	26	GND
27	IORDY	28	N.C.
29	N.C.	30	GND
31	IRQ14	32	IO16
33	A1	34	N.C.
35	A0	36	A2
37	CS0	38	CS1
39	HDLED	40	GND

FDD: Floppy Disk Drive Connector

One 34-pin daisy-chain cable allows two FDDs to be connected. One end of this cable is a 34-pin flat cable and connects to the FDD on the board. The other end connects to two FDDs.

Table 3.12. Floppy disk drive connector

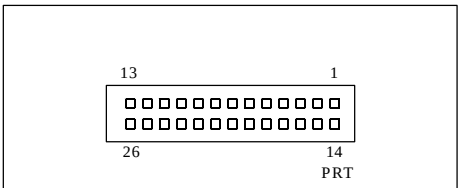


Pin No.	Function	Pin No.	Function
1	GND	2	RPM
3	GND	4	N.C.
5	GND	6	N.C.
7	GND	8	INDEX
9	GND	10	MTR0
11	GND	12	DRV1
13	GND	14	DRV0
15	GND	16	MTR1
17	GND	18	DIR
19	GND	20	STEP
21	GND	22	WDATA
23	GND	24	WGATE
25	GND	26	TRK0
27	GND	28	WRPRT
29	GND	30	RDATA
31	GND	32	SEL
33	GND	34	DSK CHG

PRT: Printer Connector

You need a connector cable to the printer connector (26-pin header) and 25-pin D-SUB connector on the printed circuit board.

Table 3.13. Printer connector

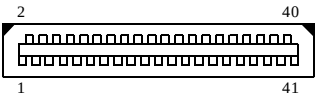


Pin No.	Function	Pin No.	Function
1	STB	14	AUTFE
2	P0	15	ERROR
3	P1	16	INIT
4	P2	17	SLCTIN
5	P3	18	GND
6	P4	19	GND
7	P5	20	GND
8	P6	21	GND
9	P7	22	GND
10	ACK	23	GND
11	BUSY	24	GND
12	PE	25	GND
13	SLCT	26	N.C.

LCD: LCD Panel Connector

Connector LCD is a 41-pin, dual-inline head for use by a flat-panel display.

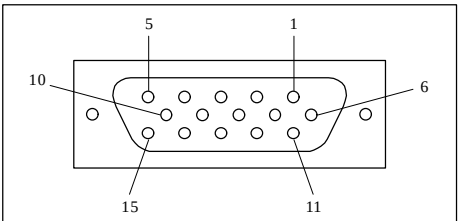
Table 3.14. LCD panel connector



Pin No.	Function	Pin No.	Function
1	P20	2	GND
3	P16	4	V_{CC}
5	P21	6	P0
7	P17	8	P8
9	P22	10	P1
11	P18	12	P9
13	P23	14	P2
15	P19	16	P10
17	V_{CC}	18	P3
19	FLM	20	P11
21	MDE	22	P4
23	LP	24	P12
25	SHFCLK	26	P5
27	3.3V	28	P13
29	3.3V	30	P6
31	ENABKL	32	P14
33	LCDVDD	34	P7
35	ENVEE	36	P15
37	GND	38	+12V
39	GND	40	+12V
41	N.C.		

VGA: VGA CRT Connector

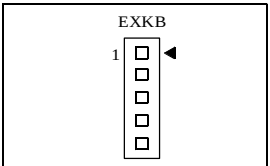
Table 3.15. VGA CRT connector



Pin No.	Function	Pin No.	Function
1	RED	9	N.C.
2	GREEN	10	GND
3	BLUE	11	N.C.
4	N.C.	12	N.C.
5	GND	13	HSYNC
6	GND	14	VSYNK
7	GND	15	N.C.
8	GND		

EXKB: External Keyboard Connector

Table 3.16. External keyboard connector



Compatible connector:XHP-5

Compatible socket contact:SCH-001T-P0.6

Manufacturer: JST

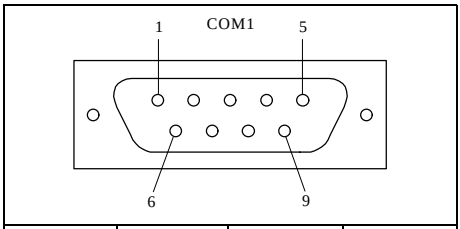
Pin No.	Function
1	KBCLK
2	KBDATA
3	N.C.
4	GND
5	V_{CC}

COM1: COM1 Connector (Female D-SUB9 Connector)

The COM1 connector.

The COM1 connector's alignment is as shown in the following illustration:

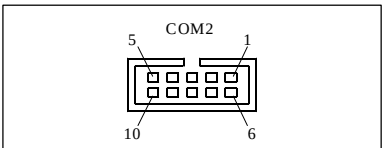
Table 3.17. COM1 connector



Pin No.	Function	Pin No.	Function
1	DCD	6	DSR
2	RX	7	RTS
3	TX	8	CTS
4	DTR	9	RI
5	GND		

COM2: COM2 Connector

Table 3.18. COM2 connector

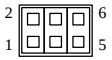
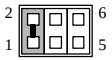
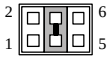
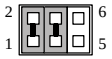
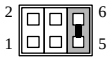
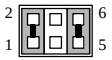
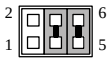
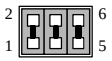


Pin	RS-232C	RS-422	RS-485
1	DCD	TX-	TX-
2	RX	TX+	TX+
3	TX	RX+	RX+
4	DTR	RX-	RX-
5	GND	GND	GND
6	DSR	RTS-	N.C.
7	RTS	RTS+	N.C.
8	CTS	CTS+	N.C.
9	RI	CTS-	N.C.
10	N.C.	N.C.	N.C.

JP1: Panel Type Selection

Here you set jumpers according to the panel to be used. The table below shows the jumper settings.

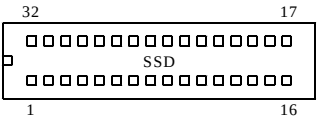
Table 3.19. Panel type selection

Resolution	CONTEC	LCD Type	Jumper Setting	Jumper Illustration
TFT 800 x 600	IPC-DT/L30S(PC)T IPC-DT/L400(PC)T IPC-DT/L400(PC) IPC-DT/L400(PC)TA IPC-DT/L400(PC)TB IPC-DT/L400(PC)A	Sharp LQ 12S41 Sharp LQ 12S56A	Open	
TFT 1024 x 768 XGA	-----	Sharp LQ141X1DG	1-2	
TFT 640 x 480	IPC-DT/M30(PC)T IPC-DT/S35(PC)T IPC-DT/S35(PC)	Sharp LQ104V1DG11	3-4	
TFT 640 x 480(S) *4	-----	-----	1-2 3-4	
STN 800 x 600	IPC-DS/L30S(PC)T IPC-DS/L400(PC)T IPC-DS/L400(PC)	Kyocera KCB8060HSTT-X6	5-6	
STN 640 x 480	-----	Matsushita EDMGR68KDF	1-2 5-6	
-----	-----	-----	3-4 5-6	
-----	-----	CRT Only	1-2 3-4 5-6	

* Factory setting: CRT Only

SSD: Semiconductor Disk Socket

Table 3.20. Semiconductor disk socket



Pin No.	Function	Pin No.	Function
1	N.C.	17	SD3
2	N.C.	18	SD4
3	N.C.	19	SD5
4	SA12	20	SD6
5	SA7	21	SD7
6	SA6	22	CE
7	SA5	23	SA10
8	SA4	24	OE
9	SA3	25	SA11
10	SA2	26	SA9
11	SA1	27	SA8
12	SA0	28	N.C.
13	SD0	29	N.C.
14	SD1	30	V_{CC}
15	SD2	31	WE
16	GND	32	V_{CC}

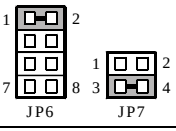
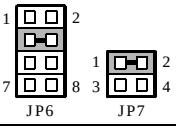
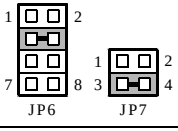
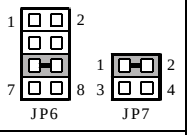
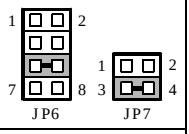
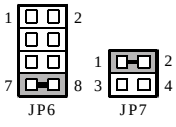
JP6 and JP7: SSD Memory Map Selection

The 32-pin SSD socket supports up to a 144MB SSD. This PnP FLASH ROM SSD can be installed as a user hard disk. If set up as drive C, the SSD can be used as a boot-up hard disk

Note!

This SSD does not have manufacturer's defaults. Set the jumpers according to the following memory map.

Table 3.21. SSD memory map

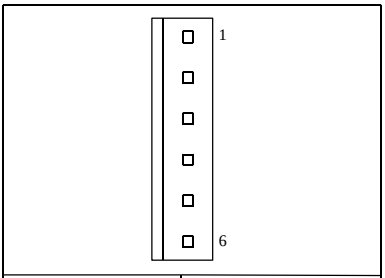
SDD memory map	Jumper setting (pins closed) JP6	JP7	Jumper illustration
CC000h-CDFFFh*	1-2	3-4	
D0000h-D1FFFh	3-4	1-2	
D4000h-D5FFFh	3-4	3-4	
D8000h-D9FFFh	5-6	1-2	
DC000h-DDFFFh	5-6	3-4	
E0000h-E1FFFh	7-8	1-2	

* Factory setting

PWR: Power Supply Connector

Table 3.22. Power supply connector

(You do not need to connect this connector if the power is supplied to the ISA backplane board.)



Pin No.	Function
1	N.C.
2	+5V
3	+12V
4	-12V
5	GND
6	GND

Compatible connector: Equivalent to the GTC6P-1

Compatible socket contact: Equivalent to the PCK18-2TR9

Manufacturer: BURNDY

A Contec ASSY product that comes with a cable is available.

(One end is soldered)

Model: PCA-6P2

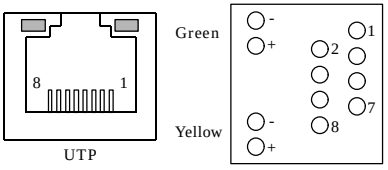
Specification: 36cm in length (AWG#18), Two in a package.

(However, cable colors are different.)

UTP: LAN Connector

The LAN connector has two LEDs. The green LED indicates the linked state and the amber LED comes on during data transfer. The pin assignment is shown next.

Table 3.23. LAN connector



LED(green):LINK

LED(yellow):ACT

Pin No.	Function
1	TX+
2	TX-
3	RX+
4	ISOLATED GND
5	ISOLATED GND
6	RX-
7	ISOLATED GND
8	ISOLATED GND
+	Pull Hi
-	LED-Yellow
+	Pull Hi
-	LED-Green

Note!

The LAN controller hardware on the board cannot be disconnected.

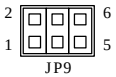
JP9: Watchdog Timer Settings

This jumper allows you to set the operation that takes place when the watchdog timer expires. Select reset or NMI.

JP9 (1-2):	Generates reset when the timer expires.
JP9 (3-4):	Generates NMI when the timer expires.
JP9 (5-6):	Clears the watchdog function (setting not allowed).

The pin assignment is shown next.

Table 3.24. Watchdog selection



Pin No.	Function
1	WDGRST
2	WDGRSTJ
3	WDGNMI
4	IOCHKJ
5	CLRWDG
6	GND

JP2: Panel Vcc Selection

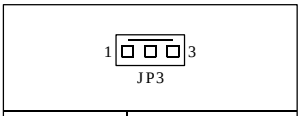
This jumper allows you to select the correct LCD panel voltage. The jumper settings are as shown below.

Table 3.25. Panel Vcc selection

Panel Vcc selection	Jumper setting (pins closed)	Jumper illustration
VCC	1-2	
VCC 3.3V	2-3	

JP3: Panel Power Supply Connector

Table 3.26. Panel power supply connector



Pin No.	Function
1	LCD+12V
2	GND
3	LCD VDD (+5V/3.3V)

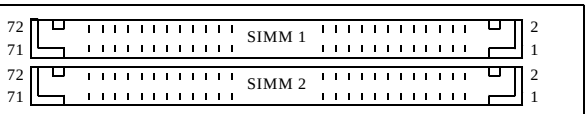
Note: The panel power connector should be used only when the panel BIOS is in use.

Pin 3 allows either +5V or +3.3V to be used dependent on the jumper 2 setting.

Installation of Memory

In the case of a computer equipped with an internal PCI local bus, two 72-pin SIMM sockets on the board support four DRAM banks (banks 0 through 3).
SIMMs 1 and 2 (72 pins x 36 bits x 2) are for single- and double-bank DRAM modules.

Table 3.27. DRAM bank settings



SIMM 1 BANK 0, 1	SIMM 2 BANK 2, 3	TOTAL MEMORY
4M	---	4M
4M	4M	8M
8M	---	8M
8M	4M	12M
8M	8M	16M
16M	---	16M
16M	8M	24M
16M	16M	32M
32M	---	32M
32M	16M	48M
32M	32M	64M
64M	---	64M
64M	32M	96M
64M	64M	128M

4. Software Utilities

This chapter describes in detail the VGA and LAN drivers attached to this board. The chapter also briefly explains the watchdog function and how to install various drivers.

VGA Driver Utility

VGA Driver

The VGA interface built into this board can support a wide variety of display modes, such as SVGA, STN, TFT, and EL. The board also allows simultaneous display on both CRT and LCD panel. However, in order to do so, you need to verify beforehand that the CRT and LCD panel display modes are the same. If two modes are different, only one of the monitors can display.

This board comes with two VGA utility floppy disks which contain files named VGA.EXE (for VGA driver setup) and AWDFLASH.EXE (for updating the FLASH BIOS).

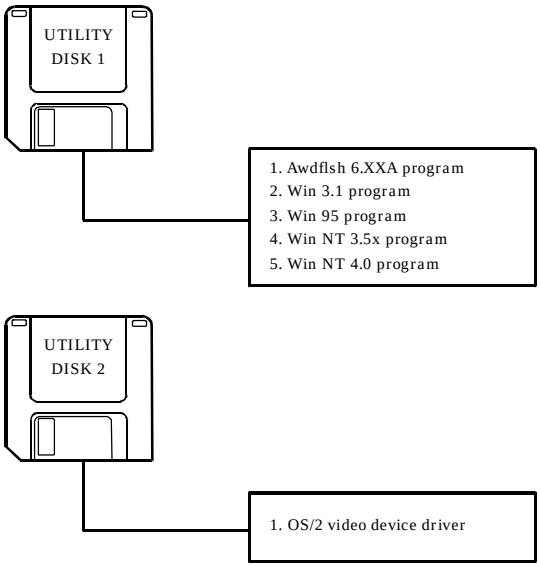


Figure 4.1. VGA driver

When you need to modify the VGA and system BIOS setup, the first thing you need to do is to install the utility disk. When the disk is installed, the corresponding files are automatically decompressed and a subdirectory is created on the hard drive.

Installation of VGA Driver for PCI

Installation of VGA Driver in Windows 3.1

1. The procedure to install the VGA driver in Windows 3.1 is the same as any other standard installation of drivers. Insert utility disk #1 into the floppy disk drive and copy it to directory Win 3.1 (the destination to copy the VGA driver to).
2. Click the Setup.exe file to run the VGA driver installation process. Follow the instructions that appear on the screen to complete the installation process.
3. When the installation is complete, shut down and restart your system to enable the changes you have made.

Installation of VGA Driver in Windows 95

1. Click the Start button to display Control Panel.
2. In Control Panel, click the Display icon. In Display Properties window, click the Settings tab.
3. Select the Settings page and click the Change Display Type button. Click the Convert button in the Adapter Type area.
4. After clicking the Have Disk button, click OK.
5. Specify the new driver path and press the Enter key. The Select Device dialog box appears. Select Chip and Tech 65550 PCI.
6. Follow the instructions that appear on the screen to finish the installation. When it is complete, restart your computer.

Installation of VGA Driver in Windows NT 3.5x/4.0

1. The procedure to install the VGA driver in Windows NT 3.5x/4.0 is the same as any other standard installation of drivers.
2. Display Control Panel in the operating system and enter into the Settings window under Display Properties.
3. After clicking Change Display Type button, follow the instructions that appear on the screen until the installation process is completed.

When the installation is complete, you need to shut down and restart your system.

Installation of VGA Driver in OS/2 Warp

1. Preparation

-- You need to have installed OS/2 DOS Support.

-- If SVGA support is installed, you must reset the system to VGA mode. VGA is the default video mode that is enabled when OS/2 is installed.

-- To restore VGA mode, use SELECTIVE INSTALL to select VGA for PRIMARY DISPLAY. For more information on this operating procedure, see Changing Display Adapter Support in the OS/2 Users Guide.

2. Driver Installation using utility disk #2

(1) Open one OS/2 session in full screen or in a window.

(2) Insert utility disk #2 (which contains the 65550 display driver) into drive A or B.

(3) At the OS/2's command prompt, input the following command and copy a series of corresponding files to the OS/2's drive.

After input of "A:", press the Enter key to set the A: drive to the default drive. After input of "Setup A: C", press the Enter key.

When the execution of the Setup program is complete, you need to shut down and restart your system in order to enable the changes you have made.

(4) When the system restarts, open the OS/2's System folder.

(5) Next, open the System Setup folder.

(6) Open Display Driver Install Object.

(7) When the Display Driver Install window appears, select PRIMARY DISPLAY and click OK.

(8) When the Primary Display Driver List window appears, select Chips and Technologies 65550/554 from the adapter type list and click OK to install the video driver.

(9) When the installation is complete, shut down and restart your system to enable the changes you have made. Before restarting your system, be sure to remove utility disk #2 from the drive.

Updating FLASH BIOS

Updating System BIOS

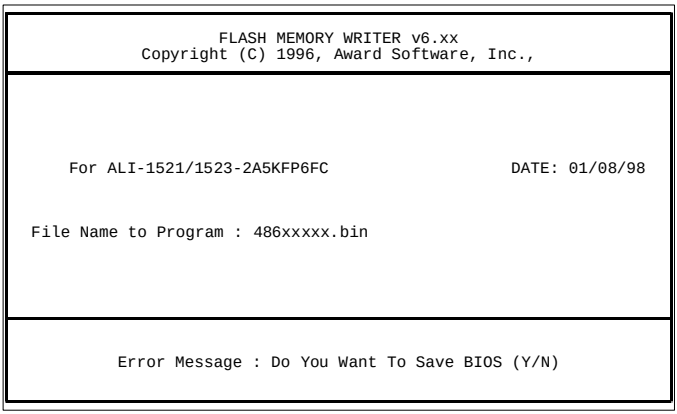
The program named Awdflash.exe contained on utility disk #1 allows you to update the system BIOS.

You need two files when updating. One is the Awdflash.exe file and the other is the system BIOS file to be updated. These two files are contained on utility disk #1. When you are ready with these two files, update the system BIOS following the steps listed below:

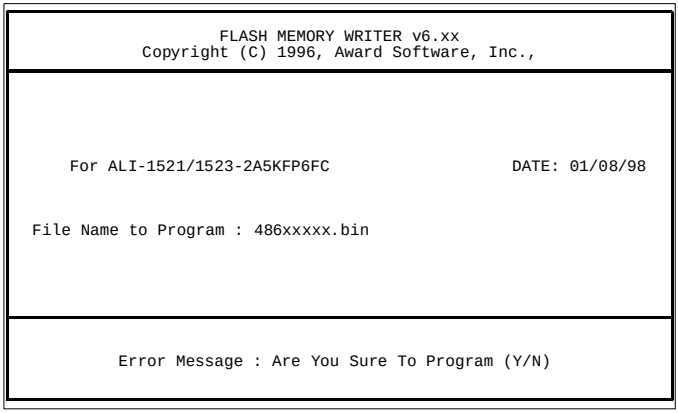
1. Copy utility disk #1 containing Awdflash.exe to drive C. Awdflash.exe functions only in DOS English mode.
2. Copy the system BIOS file obtained from Protech to an appropriate drive.
3. After entering the path to Awdflash.exe, enter the system BIOS file (486xxxxx.bin) to update the system BIOS.

<Example>C:\UTIL\AWDFLASH>AWDFLASH 486xxxxx.bin

4. As a result, the following table appears on the screen:


FLASH MEMORY WRITER v6.xx
Copyright (C) 1996, Award Software, Inc.,
For ALI-1521/1523-2A5KFP6FC
DATE: 01/08/98
File Name to Program : 486xxxxx.bin
Error Message : Do You Want To Save BIOS (Y/N)

If you want to save the original BIOS, press “Y” and then Enter key. If you select “N”, the following table appears on the screen:

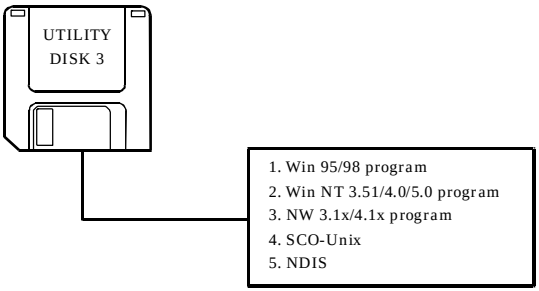

FLASH MEMORY WRITER v6.xx
Copyright (C) 1996, Award Software, Inc.,
For ALI-1521/1523-2A5KFP6FC
DATE: 01/08/98
File Name to Program : 486xxxxx.bin
Error Message : Are You Sure To Program (Y/N)

Select “Y” to update the BIOS. While BIOS updating is in progress, do not turn off the power to the system or reset the system. Such an action will destroy the BIOS. When BIOS updating is complete, the line "Programming Flash Memory ok" is displayed. If you see this line, either turn off the power to the system or reset the system. As a result, FLASH BIOS will be implemented.

LAN Driver Utility

Overview

With the LAN function enhanced this board can support a variety of network adapters. The programs you need to install the LAN driver are contained on one floppy disk.



Installation of the Driver

Installation in Microsoft Windows 98/95

1. In the Main group of Win 98/95, select the Control Panel icon.
2. In the New Hardware Found dialog box, select “Driver from disk provided by hardware manufacturer” and click OK.
3. Insert utility disk 3 into the floppy disk drive, enter the corresponding driver’s path name (A:\W95 or A:\W98, for example) and click OK in the Install From Disk dialog box.
4. When the system detects the target adapter to be installed, one of the following adapter names appears on the screen:

[Macronix MX987xx Fast Ethernet Adapter]

[Macronix MX987xx Family Fast Ethernet Adapter (ACPI)]

5. Follow the instructions that appear on the screen to complete the installation operations.
6. Restart your computer.

Installation in Microsoft Windows NT 4.0

1. After selecting My Computer in NT 4.0, click Control Panel.
2. Select the Network icon in the Control Panel window.
3. In the Network Settings dialog box, select Adapters. The Add Network Adapter dialog box appears.
4. After selecting "Have Disk…" from the network card list, press the Enter button.
5. After inserting the LAN driver disk into drive A, enter the drive and path name (A:\NT40) and click OK.
6. As a result, the following product list appears in the "Installed adapter" dialog box.

 -[Macronix MX987xx Family Fast Ethernet Adapter]

 -[Macronix MX987xx Family Fast Ethernet Adapter (ACPI)]

 In the product list, select "Macronix MX987xx Family Fast Ethernet Adapter" and click OK to install this driver.

7. When the installation is complete, Macronix MX987xx Family Fast Ethernet Adapter is displayed under Installed Adapter Cards and the corresponding driver under Installed Network Software.
8. In order to complete the network installation, click OK in the Network Setting dialog box and make sure to bind the corresponding adapter to the transport driver.
9. Restart your system.

For more information on installation, see the Readme.txt file contained in the LAN driver utility.

Setting Watchdog Timer

The watchdog timer allows you to monitor at certain intervals whether or not the system is operating. As the operation at occurrence of abnormality, you can select either "system reset" or "generation of NMI" with the jumper setting (JP9). This function is defined with I/O port 443H. To enable the watchdog timer, write a timer value (from the table below) to I/O port 443H. As a result, the system will reset itself (generation of a NMI) when the specified time elapses. To disable this function, write to I/O port 441H. After executing that command, the system will stop the watchdog timer function.

The user must create a program and control the watchdog timer function of this device. To enable the watchdog timer, write to I/O port address 443H. To disable the timer, write to I/O port address 441H. The interval error of the watchdog timer is ±4 seconds.

A watchdog timer programming example is as follows:

When enabling the watchdog timer:

```
MOV AX,000FH : Select an appropriate value (0-).
MOV DX,443H
OUT DX,AX
```

When disabling the watchdog timer:

```
MOV AX,000FH : This value will be ignored.
MOV DX,441H
OUT DX,AX
```

The following is the table to control the watchdog timer:

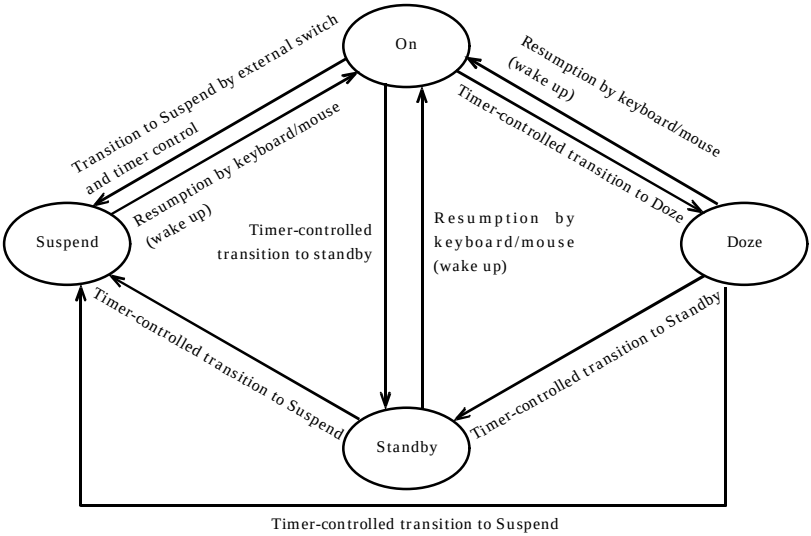
Table 4.1. Timer control table

Level	Value	Frequency/Sec.	Level	Value	Frequency/Sec.
1	F	0	9	7	64
2	E	8	10	6	72
3	D	16	11	5	80
4	C	24	12	4	88
5	B	32	13	3	96
6	A	40	14	2	104
7	9	48	15	1	112
8	8	56	16	0	120

5. Green PC Function

This chapter describes the Green PC function in detail.

Power Conservation Block Diagram



CPU Doze Mode

1. When timeout occurs, the CPU clock drops to 8MHz.
2. The buzzer sounds once.
3. The LED connected to the GRN connector (see page 13) flashes to indicate power conservation state.
4. Activities are monitored according to Advanced Setup settings.
5. When some activity takes place, the system exits Doze mode to enter into On mode.

System Standby Mode

1. When timeout occurs, the CPU clock drops to 8MHz.
2. The buzzer sounds two times.
3. The LED connected to the GRN connector (see page 13) flashes to indicate power conservation state.
4. The level-1 cache is disabled.
5. The VGA monitor screen goes blank.
6. The hard disk driving motor stops.
7. When some activity takes place, the system exits Standby mode to enter into On mode.

System Suspend Mode

1. When timeout occurs, the CPU clock drops to 8MHz.
2. The buzzer sounds three times.
3. The LED connected to the GRN connector (see page 13) flashes to indicate power conservation state.
4. The level-2 cache is disabled.
5. The VGA monitor screen goes blank.
6. The hard disk driving motor stops.
7. Activities are monitored according to Advanced Setup settings.
8. If the system is in Suspend mode, only resumption by keyboard/mouse/alarm can wake up (resume) the system.

6. Award BIOS Setup

This chapter describes how to set up the Award BIOS.

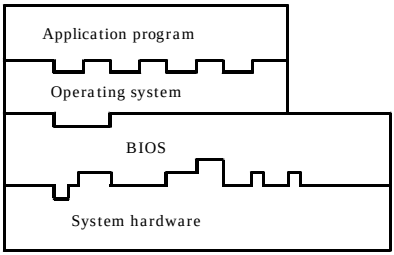
Overview

This chapter explains the BIOS functions that manage various system functions.
The BIOS by Award Software Inc. is installed on the system chip set of this board. This section explains the BIOS functions that manage special system functions. The following sections explain how to use the BIOS system chip set SETUP menu.

Application programs (word processor, spreadsheet, game, and so on), manage the keyboard, monitor, disk drive, and memory by using an operating system, such as DOS or OS/2.

On the other hand, an operating system initializes and configures the computer hardware by using the BIOS (Basic Input and Output System) stored in ROM (Read-Only Memory). When used as the interface between the hardware and operating system, the BIOS allows basic changes to be made on the system hardware without the need for writing a new operating system.

The following diagram shows relationships among the system hardware, BIOS, operating system and application programs.

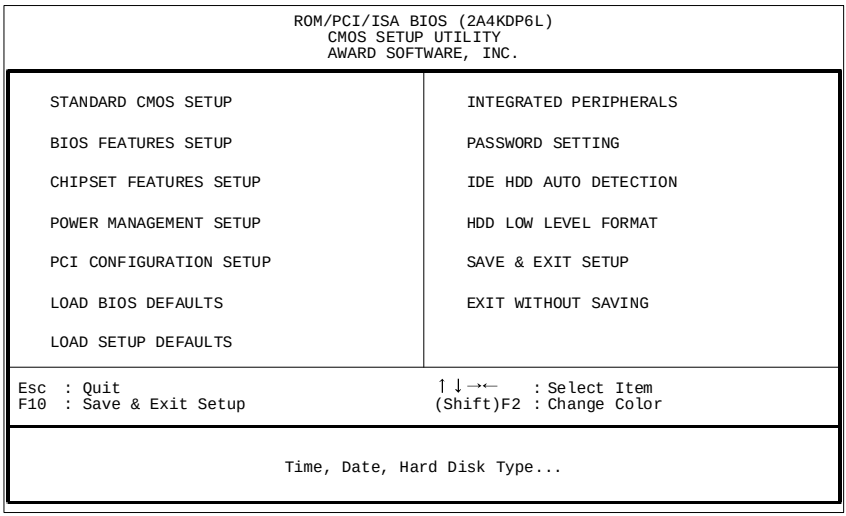


Starting Setup Program

When the system is turned on, the BIOS runs the POST (Power-On Self Test) routine and displays the following message in the lower portion of the screen:

PRESS <DEL> TO ENTER SETUP, ESC TO SKIP MEMORY TEST

While this message is displayed on the screen, if you press the Del key (located at the lowest end of the numeric keypad and overlaid on the decimal-point key), the setup program starts up. After a short while, the main menu of the Award's setup program appears on the screen.



You can change the menu item to be highlighted by using the up/down arrow key at the cursor. As you highlight each menu item, the functional description of that item appears at the bottom of the window. If you are using a color monitor, the Shift + F2 keys allows you to modify combinations of colors.

The main menu has the following setting items:

STANDARD CMOS SETUP:
Sets up the BIOS for standard AT-compatible computers.

BIOS FEATURES SETUP:
Sets up Award's enhancement features.

CHIPSET FEATURES SETUP:
Sets up the features specific to the chip set.

POWER MANAGEMENT SETUP:
Sets power consumption.

PNP/PCI CONFIGURATION:
Configures the PCI bus system.

LOAD BIOS DEFAULTS:
Indicates the minimum settings set up by the manufacturer, which are required for your system to be able to operate.

LOAD SETUP DEFAULTS:
These chip-set default values are set up for the system to achieve its maximum performance.

INTEGRATED PERIPHERALS:
Sets up an IDE hard disk and programmed I/O functions.

PASSWORD SETTING:
Allows you to specify, change, or not to use a password. With these options, you can either restrict access to the system or settings or allow only setting.

IDE HDD AUTO DETECTION:
When you don't know the parameters of your own hard disk, this item allows the parameters to be detected or set up automatically.

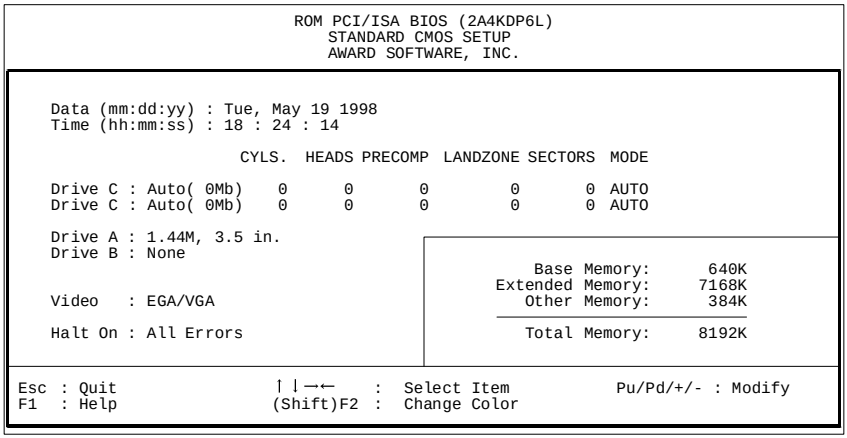
HDD LOW LEVEL FORMAT:
This is the utility that performs low-level formatting on the hard disk.

SAVE AND EXIT SETUP:
Saves all changes you have made to CMOS before exiting setup mode.

EXIT WITHOUT SAVING:
Immediately proceeds to exit setup mode without saving any change you have made to CMOS.

STANDARD CMOS SETUP Menu

When you highlight STANDARD CMOS SETUP and press the Enter key, the following screen will appear:


ROM PCI/ISA BIOS (2A4KDP6L)
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.
Data (mm:dd:yy) : Tue, May 19 1998
Time (hh:mm:ss) : 18 : 24 : 14
CYLS. HEADS PRECOMP LANDZONE SECTORS MODE
Drive C : Auto(0Mb) 0 0 0 0 0 AUTO
Drive C : Auto(0Mb) 0 0 0 0 0 AUTO
Drive A : 1.44M, 3.5 in.
Drive B : None
Video : EGA/VGA
Halt On : All Errors
Base Memory: 640K
Extended Memory: 7168K
Other Memory: 384K
Total Memory: 8192K
Esc : Quit
F1 : Help
↑↓→← : Select Item
(Shift)F2 : Change Color
Pu/Pd/+/- : Modify

The basic and extended memory sizes are displayed in the above table. Since these parameter values are automatically read from the system, the user does not need to set them. A calendar is also displayed on the above screen. The day of the week is displayed based on the date set on the system clock. The current date is flashing. The time and date shown may not be correct since they have not yet been set. Each parameter is described next.

Date

The day of the month is displayed in mm-dd -yy format. For information on the range for each value, see the CMOS SETUP screen. The day of the week is calculated automatically.

Time of Day

The time of day is displayed in hh-mm-ss format using the 24-hour system. To enter time after 12 noon, specify the value after adding 12 to the "hour". To set to 4:30 p.m, for example, enter "16:30:00".

Drive C Type/Drive D Type

In these categories, you specify the type of hard disk drive C or D installed in your computer. The standard BIOS has 45 predefined types and two user-definable types. Type 1 or 45 is predefined. Type User can be defined by the user.

Primary Master/Primary Slave/Secondary Master/Secondary Slave

In these categories, you specify the types of two channels installed on your computer. The extended IDE BIOS has 45 predefined types and four user-definable types. Types 1-45 are predefined. Type User can be defined by the user.

Press the <PgUp>/<+> or <PgDn>/<-> keys, either select or enter the number representing the hard disk type, and press Enter. However, the drive specifications must match the details in the drive table. If incorrect information is input in this category, the hard disk will not function correctly. If the hard disk drive type does not match or the intended drive type is not output in a list, you can define own drive type if you specify type "User".

If you select type "User", you need to know the information provided later. Enter this information directly from the keyboard and press Enter. The information you need to know is contained in the document provided by the hard disk vendor or the manufacturer of the system.

If the HDD interface controller is ESDI, select type "1".

If the HDD interface controller is SCSI, select "None".

If the HDD interface controller is CD-ROM, select "None".

TYPE

Using a specific identification parameter, specify the drive number.

CYLS.

This is the number of cylinders detected with the specified drive type.

HEADS

This is the number of heads detected with the specified drive type.

WPCOM

WPcom is a read delay circuit which takes into account the difference between the inner and outer edges on the surface of the disk platter. For this numeric value, specify the signal start cylinder.

LZONE

Lzone means the head's landing zone. Using a numeric value, specify the cylinder that normally ships the head when the system is in shut-down state.

SIZE (CAPACITY)

This is the formatted capacity of the drive, calculated based on expression (header count) x (cylinder count) x (number of sets) x (512 bytes/sectors).

Drive A and Drive B

Available choices are "360KB 5.25-inch", "1.2MB 5.25-inch", "720KB 3.5-inch", "1.44MB 3.5-inch", "2.88MB 3.5-inch", and "None". "Not Installed" can also be specified for a workstation that does not have a disk.

Video

Available choices are "Monochrome", "Color 40", "VGA/EGA", and "Color 80".

Halt On

Specify the error condition that stops system startup at BIOS startup. Available choices are "All Errors", "No Errors", "All, But keyboard", "All, But Diskette", and "All, But Disk/key".

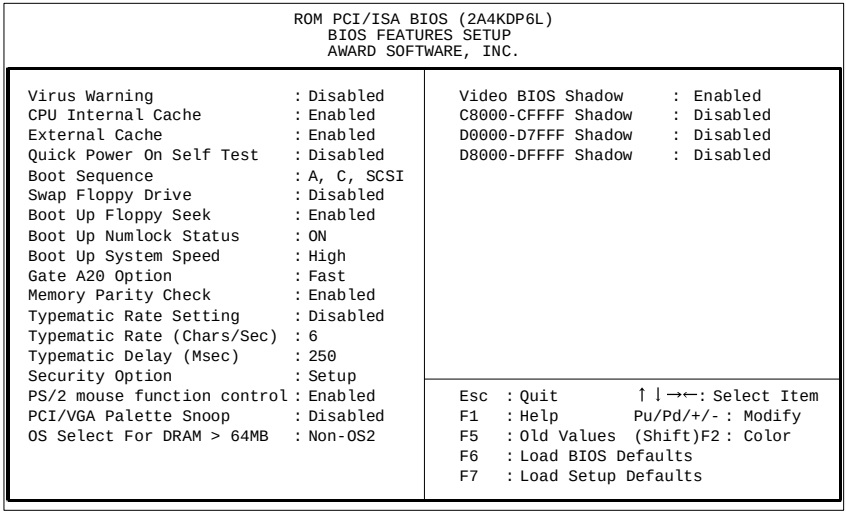
Hard Disk Attributes

Table 6.1. Award's hard disk types

Type	Cylinders	Heads	V-P comp	LZone	Sect	Capacity
1	306	4	128	305	17	10
2	615	4	300	615	17	20
3	615	6	300	615	17	30
4	940	8	512	940	17	62
5	940	6	512	940	17	46
6	615	4	65535	615	17	20
7	642	8	256	511	17	30
8	733	5	65535	733	17	30
9	900	15	65535	901	17	112
10	820	3	65535	820	17	20
11	855	5	65535	855	17	35
12	855	7	65535	855	17	49
13	306	8	128	319	17	20
14	733	7	65535	733	17	42
15	000	0	0000	000	00	00
16	612	4	0000	663	17	20
17	977	5	300	977	17	40
18	977	7	65535	977	17	56
19	1024	7	512	1023	17	59
20	733	5	300	732	17	30
21	733	7	300	732	17	42
22	733	5	300	733	17	30
23	306	4	0000	336	17	10
24	977	5	65535	976	17	40
25	1024	9	65535	1023	17	76
26	1224	7	65535	1223	17	71
27	1224	11	65535	1223	17	111
28	1224	15	65535	1223	17	152
29	1024	8	65535	1023	17	68
30	1024	11	65535	1023	17	93
31	918	11	65535	1023	17	83
32	925	9	65535	926	17	69
33	1024	10	65535	1023	17	85
34	1024	12	65535	1023	17	102
35	1024	13	65535	1023	17	110
36	1024	14	65535	1023	17	119
37	1024	2	65535	1023	17	17
38	1024	16	65535	1023	17	136
39	918	15	65535	1023	17	114
40	820	6	65535	820	17	40
41	1024	5	65535	1023	17	42
42	1024	5	65535	1023	26	65
43	809	6	65535	852	17	40
44	809	6	65535	852	26	61
45	776	8	65535	775	33	100
47	---	---	AUTO	---	---	---

BIOS FEATURES SETUP

When you select BIOS FEATURES SETUP on the main menu, the following screen appears.


ROM PCI/ISA BIOS (2A4KDP6L)
BIOS FEATURES SETUP
AWARD SOFTWARE, INC.
Virus Warning : Disabled
CPU Internal Cache : Enabled
External Cache : Enabled
Quick Power On Self Test : Disabled
Boot Sequence : A, C, SCSI
Swap Floppy Drive : Disabled
Boot Up Floppy Seek : Enabled
Boot Up Numlock Status : ON
Boot Up System Speed : High
Gate A20 Option : Fast
Memory Parity Check : Enabled
Typematic Rate Setting : Disabled
Typematic Rate (Chars/Sec) : 6
Typematic Delay (Msec) : 250
Security Option : Setup
PS/2 mouse function control : Enabled
PCI/VGA Palette Snoop : Disabled
OS Select For DRAM > 64MB : Non-OS2
Video BIOS Shadow : Enabled
C8000-CFFFF Shadow : Disabled
D0000-D7FFF Shadow : Disabled
D8000-DFFFF Shadow : Disabled
Esc : Quit ↑↓→←: Select Item
F1 : Help Pu/Pd/+/- : Modify
F5 : Old Values (Shift)F2 : Color
F6 : Load BIOS Defaults
F7 : Load Setup Defaults

BIOS FEATURES SETUP allows you to see what functions are supported by the chip set and Award BIOS. Since a shadow RAM is also supported, you can copy the contents of ROM BIOS to the shadow RAM when booting. This results in higher performance. If you use the main menu to change settings, you can call out defaults at any time.

This is described later in more detail. To display help information for each item, after highlighting the corresponding item, press the F1 key. A window appears on the screen displaying various detailed options that are available under each item. Each setting in BIOS FEATURES SETUP is described as follows:

CPU Internal Cache

If a 486 CPU is installed on your system, always select "Enabled" under this item even if an external cache is installed. If an external cache is not installed, selecting "Enabled" under this item allows you to use an 8KB cache in the 486 CPU.

External Cache

Select either "Enabled" or "Disabled" depending on whether to enable or disable the external cache.

Quick Power On Self Test

The use of this item speeds up the POST (Power On Self Test) which runs after your computer is turned on. If you set to "Enabled", the BIOS will either truncate or skip some check items during the POST.

Boot Sequence

Specify whether drive A or drive C should be checked first by the system when booting.

Boot Up Floppy Seek

Under this item, specify whether the system should access the floppy disk drive or the hard disk drive at boot up after the power is turned on.

Boot Up Numlock Status

Specify whether or not to automatically enable NumLock on the keyboard when the power is turned on.

Boot Up System Speed

If you select "High", the system setup process will run in turbo speed (high speed) mode at boot up. If you select "Low", the system setup process will run in normal speed mode. Regardless of the mode selected, you can toggle between these two modes while the system is running.

Memory Parity Check

Specify "Enabled" or "Disabled" depending on whether or not you want to have the system perform parity check at boot up. If you select "Disabled", the BIOS will ignore a parity error even if it is detected. Always set this item to "Enabled" in order to verify that the memory is normal whenever the PC is started.

Gate A20 Option

If you set this item to "Fast", the A20 signal will be controlled by a method specific to the chip set.

Typematic Rate Setting

Select "Enabled" if you want to enable keyboard's Typematic characteristics. Typematic means that when you continue to hold down one key, its corresponding character is input repeatedly. For example, if you continue to hold down key "A", character "a" will be displayed repeatedly until you release the "A" key. This items defaults to "Disabled".

Typematic Rate (Chars/Sec)

This item allows you to define the keyboard Typematic rate (the speed at which the character is generated while you hold down a key).

Typematic Delay (Msec)

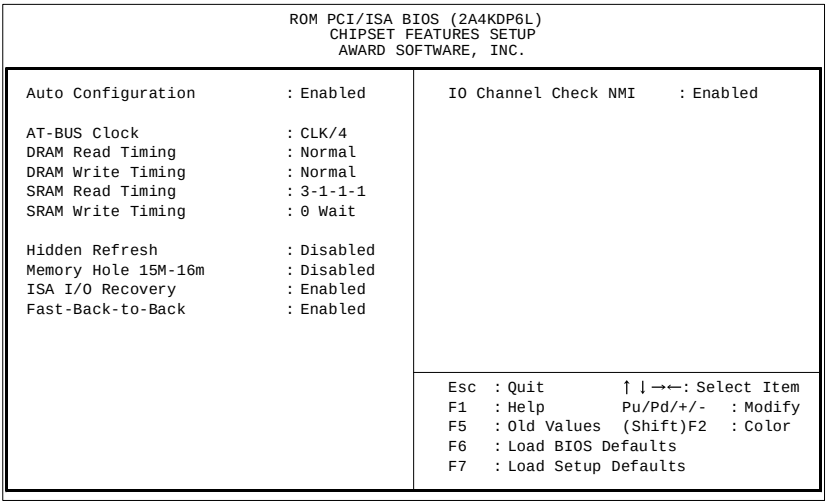
This item allows you to define the length of time before the Typematic function is enabled (the length of time from the pressing of a key through the end of repeating that character).

Security Option

This category allows you to specify whether you want to restrict access to the system and setup both or to restrict access to setup only. To disable this security option, select the password setting item on the main menu. As you are prompted to input a password, simply press the Enter key without entering any other key. This disables the security option. When the option is disabled, the system starts up allowing you to enter into the setup program.

CHIPSET FEATURES SETUP

When you select CHIPSET FEATURES SETUP on the main menu, the following screen appears.


ROM PCI/ISA BIOS (2A4KDP6L)
CHIPSET FEATURES SETUP
AWARD SOFTWARE, INC.
Auto Configuration : Enabled
AT-BUS Clock : CLK/4
DRAM Read Timing : Normal
DRAM Write Timing : Normal
SRAM Read Timing : 3-1-1-1
SRAM Write Timing : 0 Wait
Hidden Refresh : Disabled
Memory Hole 15M-16m : Disabled
ISA I/O Recovery : Enabled
Fast-Back-to-Back : Enabled
IO Channel Check NMI : Enabled
Esc : Quit ↑ ↓ →← : Select Item
F1 : Help Pu/Pd/+/- : Modify
F5 : Old Values (Shift)F2 : Color
F6 : Load BIOS Defaults
F7 : Load Setup Defaults

Move the cursor to the target item and press the F1 key. This displays the item's all options you can choose from.

Auto Configuration

When you select "Enabled", the BIOS will automatically set up the cache and clock based on the detected CPU clock speed. No any other parameter can be changed. If you set this item to "Disabled", you must set the parameters related to the DRAM, cache, and I/O bus clock.

DRAM Timing Option

This option adds as many wait states as specified here when reading from the DRAM. The fewer the number of wait states, the higher the performance will be.

SRAM Timing Option

This option adds as many wait states as specified here when reading from the SRAM. The fewer the number of wait states, the higher the performance will be.

AT-BUS Clock

Define the AT bus clock value. Normally, the AT bus clock value is set to 8MHz. For example, if you system clock is 33MHz, select 4/1 CLKIN. All values that derive from CLKIN are referred to as synchronous mode.

The option named 7.159MHz is referred to as asynchronous mode.

IO Channel Check NMI

This item allows you to select whether or not to report the ISA bus IOCHK signal to NMI.

POWER MANAGEMENT SETUP

When you select POWER MANAGEMENT SETUP on the main menu, the following screen appears.

```
                    ROM PCI/ISA BIOS (2A4KDP6L)
                      POWER MANAGEMENT SETUP
                      AWARD SOFTWARE, INC.

Power Management        : Disable          IRQ5   (LPT 2)          : ON
PM Control by APM       : Yes              IRQ6   (Floppy Disk)    : ON
Video Off Option        : Susp,Stby->off   IRQ7   (LPT 1)          : ON
Video Off Method        : V/H Sync+Blank   IRQ8   (RTC Alarm)      : OFF
Modem Use IRQ           : 3                IRQ9   (IRQ Redir)      : ON
                                           IRQ10  (Reserved)       : OFF
       ** PM Timers **                     IRQ11  (Reserved)       : OFF
HDD Standby Timer       : Disabled         IRQ12  (PS/2 Mouse)     : ON
Doze Timer Select       : Disabled         IRQ13  (Coprocessor)    : OFF
Standby Timer Select    : Disabled         IRQ14  (Hard Disk)      : ON
Inactive Timer Select   : Disabled         IRQ15  (Reserved)       : OFF

       ** PM Events **
VGA                     : OFF
FDD (3FXh)              : ON
LPT & (1FXh)            : LPT/COM          Esc : Quit        ↑↓→←:Select Item
HDD (1FXh)              : ON               F1  : Help        Pu/Pd/+/-   : Modify
NMI                     : OFF              F5  : Old Values  (Shift)F2   : Color
IRQ3 (COM 2)            : ON               F6  : Load BIOS Defaults
IRQ4 (COM 1)            : ON               F7  : Load Setup Defaults
```

Under this category, specify how much system power should be conserved by selecting the variables listed below. This item defaults to "Disabled". When you are finished with setting, press the Esc key to return to the main menu.

Power Management

Under this item, specify how much system power should be conserved. If you select "Max Saving", all timers will use their MIN values.

PM Control by APM

If you select "Yes", the system BIOS enters into one of the PM modes (Doze, Standby or Suspend) after waiting for an APM prompt. If APM is installed and the task is running, APM does not instruct the BIOS to put the system into any power conservation mode even if the timer expires.

DOZE MODE TIMEOUT

When the length of time specified here elapses after the system becomes inactive, the system enters into Doze mode. The item can be set to a value within a range of 10 seconds through two hours or to "Disabled".

STANDBY MODE TIMEOUT

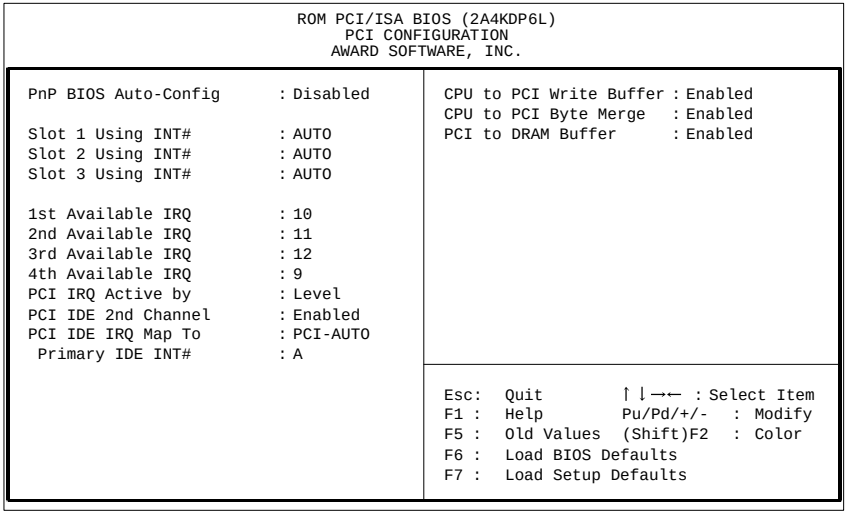
When the length of time specified here elapses after the system becomes inactive, the system enters into Standby mode. The item can be set to a value within a range of 30 seconds through two hours or to "Disabled".

SUSPEND MODE TIMER

When the length of time specified here elapses after the system becomes inactive, the system enters into Suspend mode. The item can be set to a value within a range of 30 seconds through two hours or to "Disabled".

PCI CONFIGURATION SETUP

When you select PCI CONFIGURATION SETUP on the main menu, the following screen appears.


ROM PCI/ISA BIOS (2A4KDP6L)
PCI CONFIGURATION
AWARD SOFTWARE, INC.
PnP BIOS Auto-Config : Disabled
Slot 1 Using INT# : AUTO
Slot 2 Using INT# : AUTO
Slot 3 Using INT# : AUTO
1st Available IRQ : 10
2nd Available IRQ : 11
3rd Available IRQ : 12
4th Available IRQ : 9
PCI IRQ Active by : Level
PCI IDE 2nd Channel : Enabled
PCI IDE IRQ Map To : PCI-AUTO
Primary IDE INT# : A
CPU to PCI Write Buffer : Enabled
CPU to PCI Byte Merge : Enabled
PCI to DRAM Buffer : Enabled
Esc: Quit ↑↓→← : Select Item
F1 : Help Pu/Pd/+/- : Modify
F5 : Old Values (Shift)F2 : Color
F6 : Load BIOS Defaults
F7 : Load Setup Defaults

The PCI device's IRQ can be set in the BIOS. Highlight a target item and press the F1 key. This displays all options available under the item allowing you to select one. The user must select the target option. When you are finished with setting according to the system configuration, press the Esc key to return to the main menu.

LOAD BIOS DEFAULTS

AUTO CONFIGURATION WITH BIOS DEFAULTS
If you select LOAD BIOS DEFAULTS, the BIOS defaults will be loaded. If you select this option when the system diagnostic function is no longer usable, the following message will appear:

```
Load BIOS Default (Y / N)? Y
```

To use the BIOS defaults, change the prompt to "Y" and press the Enter key. As you turn on the board, the defaults will automatically be loaded onto CMOS.

LOAD SETUP DEFAULTS

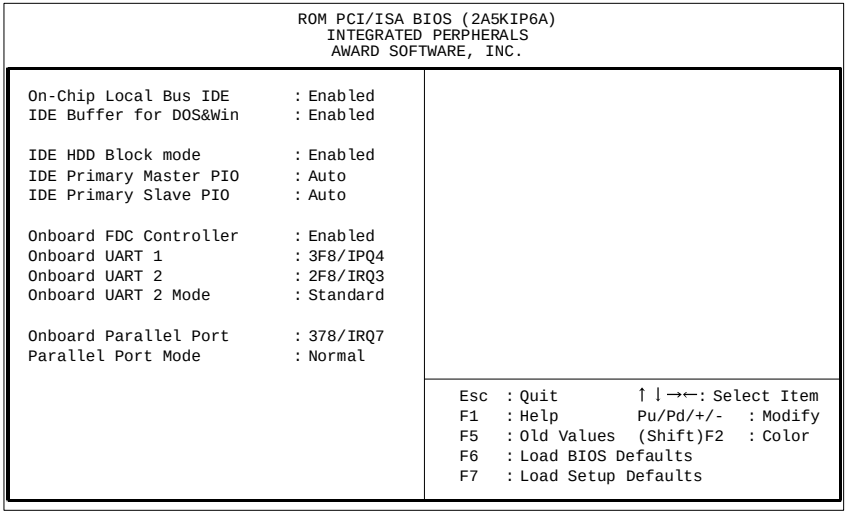
Auto configuration With Setup Defaults
If you select this item on the main menu, the setup program's defaults will be used. When the system does not function as it should, use this option as a diagnostic means. As you select this item, the following message will appear:

```
Load SETUP Default (Y / N)? Y
```

To use the setup program 's defaults, change the prompt to "Y" and press the Enter key. The setup program 's defaults will automatically be loaded onto CMOS.

INTEGRATED PERIPHERALS

When you select the INTEGRATED PERIPHERALS option on the main menu, the following screen appears.


ROM PCI/ISA BIOS (2A5KIP6A)
INTEGRATED PERPHERALS
AWARD SOFTWARE, INC.
On-Chip Local Bus IDE : Enabled
IDE Buffer for DOS&Win : Enabled
IDE HDD Block mode : Enabled
IDE Primary Master PIO : Auto
IDE Primary Slave PIO : Auto
Onboard FDC Controller : Enabled
Onboard UART 1 : 3F8/IPQ4
Onboard UART 2 : 2F8/IRQ3
Onboard UART 2 Mode : Standard
Onboard Parallel Port : 378/IRQ7
Parallel Port Mode : Normal
Esc : Quit ↑↓→←: Select Item
F1 : Help Pu/Pd/+/- : Modify
F5 : Old Values (Shift)F2 : Color
F6 : Load BIOS Defaults
F7 : Load Setup Defaults

Move the cursor to the target item and press the F1 key. This displays the item's all options you can choose from.

The user must select the target option.

When you are finished with setting according to the system configuration, press the Esc key to return to the main menu.

On-Chip Local Bus IDE

If you are not going to use another IDE interface, always set this item to "Enabled".

IDE Buffer for DOS&Win

Setting this item to "Enabled" to use the on-chip "read ahead/posted write" IDE buffer results in higher IDE device throughput. The use of the buffer slows down the operation of the IDE device. If the operation of the IDE device is questionable, try changing this setting to verify the best operations.

IDE HDD Block Mode

The use of this field allows the hard disk controller to use high-speed block mode when it transfers data to and from the hard disk drive.

IDE Primary Master/Slave PIO

The use of these fields allows the system's hard disk controller to function at a higher rate of speed. The use of PIO (Programmed Input/Output), rather than letting the BIOS and the hard disk drive transfer a series of commands between them, allows the BIOS to interact directly with the control or CPU.

If you select "AUTO", the BIOS will be selected in the most appropriate mode.

Onboard FDC Controller

This option allows you to select the onboard FDC port.

Onboard UART/Parallel Port

The use of these fields allows you to select an onboard serial/parallel port and its address.
The ports default to the following values:

UART 1	3F8/IRQ4
UART 2	2F8/IRQ3
Parallel port	378/IRQ7

Onboard UART 2 Mode

In this field, specify computer's UART2 mode selecting from such choices as Standard, HPSIR and ASKIR.

Parallel Port Mode

This field allows you to specify the parallel port's mode function.

SPP	Standard Printer Port
EPP	Enhanced Parallel Port
ECP	Enhanced Capabilities Port
ECP+EPP	Enhanced Capabilities Port or Enhanced Parallel Port

PASSWORD SETTING

To enable this item, select the PASSWORD SETTING option on the main menu. The following message will appear in the center of the screen to assist you in creating a password.

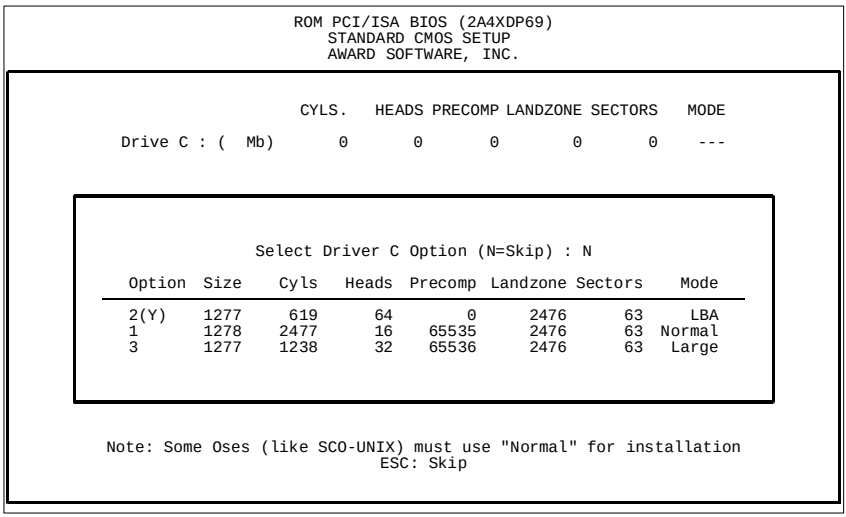
Enter a password using up to eight characters and press the Enter key. The new password just entered will overwrite the previous password stored in the CMOS memory. Since you will be asked to confirm the password, enter the same password once more and press the Enter key. If you press the Esc key instead, you can abort the password entry operation and the password will not be updated.

To disable a password, simply press the Enter key when you are prompted for a password. This displays the message shown below confirming that the password will be invalidated. When the password is invalidated, the system starts up and you can be in the Setup program.

If you set Security Option to System on the BIOS FEATURES SETUP menu, you will be asked for a password when booting and when you enter into the Setup program. If you select Setup under Security Option on the BIOS FEATURES SETUP menu, you will be asked for a password only when you enter into the Setup program.

IDE HDD AUTO DETECTION

When you select the IDE HDD AUTO DETECTION option on the main menu, the following screen appears.


ROM PCI/ISA BIOS (2A4XDP69)
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.
CYLS. HEADS PRECOMP LANDZONE SECTORS MODE
Drive C : (Mb) 0 0 0 0 0 ---
Select Driver C Option (N=Skip) : N
Option Size Cyls Heads Precomp Landzone Sectors Mode
2(Y) 1277 619 64 0 2476 63 LBA
1 1278 2477 16 65535 2476 63 Normal
3 1277 1238 32 65536 2476 63 Large
Note: Some Oses (like SCO-UNIX) must use "Normal" for installation
ESC: Skip

AUTO DETECTION

The BIOS's Setup program displays all modes supported by the HDD including NORMAL, LBA, and LARGE.

If the HDD does not support LBA mode, the LBA option is not displayed.

If an HDD of which the number of cylinders is fewer than 1,024 does not exist, the LARGE option is not displayed. The user can select an appropriate mode.

HDD MODE

Award BIOS supports three HDD modes, NORMAL, LBA, and LARGE.

NORMAL Mode

This is a general-purpose access mode. Neither the BIOS nor the IDE controller performs conversion during accessing. The maximum number of cylinders, heads and sectors in NORMAL mode is 1,024, 16 and 63 respectively.

Cylinder count:	(1024)
x Head count:	(16)
x Sector count:	(63)
x Byte count/sector	(512)
Total: 528 MB	

When the user sets the HDD to normal mode, the maximum accessible HDD size will be 528 MB. However, the physical size might be larger than that.

LBA (Logical Block Addressing) Mode

This is a new way to access the HDD in order to overcome a bottleneck of being 528 MB. The number of cylinders, heads, and sectors displayed by the Setup program may differ from the number of physical cylinders, heads, and sectors in the HDD.

When accessing the HDD, the IDE controller converts logical addresses written using sector, head and cylinder numbers into specific physical addresses in the HDD.

LBA mode supports a maximum HDD size of 8.4 GB. This size can be found with the following formula:

Cylinder count:	(1024)
x Head count:	(16)
x Sector count:	(63)
x Byte count/sector	Total:(512)
Total: 528 MB	

LARGE Mode

Some IDE HDDs are equipped with more than 1,024 cylinders without support for LBA. The BIOS also supports this type of HDD.

CYLS	HEADS	SECTOR	MODE
1120	16	59	NORMAL
560	32	59	LARGE

The BIOS indicates to DOS (or any other OS) as if the number of cylinders were fewer than 1,024 by dividing the number of cylinders by 2 and, at the same time, multiplies the number of heads by 2. In order to access correct HDD addresses, inverse conversion takes place in INT 13h.

Cylinder count	(1024)
x Head count:	(32)
x Sector count:	(63)
x Byte count/sector	(512)
Total: 1 GB	

Note!

In order to support an LBA- or LARGE-mode HDD, you need to use some software. Any such software is located in the Award HDD Service Routine (INT 13h). However, if you attempt to access the HDD by selecting LBA (LARGE) mode, it may fail if you have an operating system in which the entire INT.13h has been converted.

SAVE & EXIT SETUP

When you are finished with adjusting settings as necessary, you need to store changes you have made in CMOS RAM. To save these new settings, after verifying them select SAVE & EXIT SETUP and press the Enter key. Your computer restarts by itself and the new values will be enabled. If you press the Del key when booting, you can always adjust individual values by accessing the Setup program. When you want to cancel the changes you have made, EXIT WITHOUT SAVE will restore the previous settings.

7. Appendixes

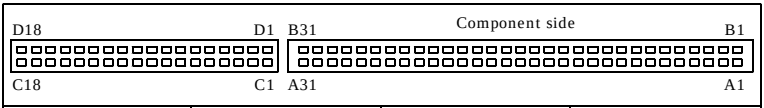
A. Expansion Bus

This appendix explains ISA bus pin assignment.

ISA Bus Pin Assignment

This board's ISA bus is called "Gold Finger". This ISA bus is comprised of two sets of which one consisting of 62 pins and the other consisting of 36 pins.
The pin assignment is as shown below:

Table 7.1. ISA bus pin assignment



B		A		D		C	
Pin No.	Function	Pin No.	Function	Pin No.	Function	Pin No.	Function
B1	GND	A1	-I/O CH CHK	D1	-MEMCS16	C1	SBHE
B2	RESET	A2	SD07	D2	-I/OCS16	C2	LA23
B3	+5V	A3	SD06	D3	IRQ10	C3	LA22
B4	IRQ9	A4	SD05	D4	IRQ11	C4	LA21
B5	-5V	A5	SD04	D5	IRQ12	C5	LA20
B6	DRQ2	A6	SD03	D6	IRQ15	C6	LA19
B7	-12V	A7	SD02	D7	IRQ14	C7	LA18
B8	OWS	A8	SD01	D8	-DACK0	C8	LA17
B9	+12V	A9	SD00	D9	DRQ0	C9	-MEMR
B10	GND	A10	-I/O CH RDY	D10	-DACK5	C10	-MEMW
B11	-SMEMW	A11	AEN	D11	DRQ5	C11	SD08
B12	-SMEMR	A12	SA19	D12	-DACK6	C12	SD09
B13	-IOW	A13	SA18	D13	DRQ6	C13	SD10
B14	-IOR	A14	SA17	D14	-DACK7	C14	SD11
B15	-DACK3	A15	SA16	D15	DRQ7	C15	SD12
B16	-DRQ3	A16	SA15	D16	+5V	C16	SD13
B17	-DACK1	A17	SA14	D17	-MASTER	C17	SD14
B18	-DRQ1	A18	SA13	D18	GND	C18	SD15
B19	-REFRESH	A19	SA12				
B20	BCLK	A20	SA11				
B21	IRQ7	A21	SA10				
B22	IRQ6	A22	SA09				
B23	IRQ5	A23	SA08				
B24	IRQ4	A24	SA07				
B25	IRQ3	A25	SA06				
B26	-DACK2	A26	SA05				
B27	T/C	A27	SA04				
B28	BALE	A28	SA03				
B29	+5V	A29	SA02				
B30	OSC	A30	SA01				
B31	GND	A31	SA00				

B. Technical Summary

This appendix explains a series of maps in detail.

Interrupt Map

Table 7.2. Interrupt map

IRQ #	System resource
NMI	I/O channel check
0	Reserved. Interval timer
1	Reserved. Keyboard buffer full
2	Reserved. Cascaded interrupt from slave PIC
3	COM2 *1
4	COM1 *1
5	Available to users
6	Diskette drive controller
7	LPT1 *1
8	Real-time clock
9	Available to users
10	Available to users. (When defaulted, the LAN of the internal PCI bus uses this IRQ. *2)
11	Available to users
12	Onboard mouse port. (Setting to "not in use" makes this IRQ available to users.)
13	Reserved. Match coprocessor.
14	Primary IDE. (Setting to "not in use" makes this IRQ available to users.)
15	Available to users.

*1: Predefined value (However changing to another IRQ is allowed.)

*2: However changing to another IRQ is allowed during BIOS setup.

RTC and CMOS RAM Map

Table 7.3. RTC and CMOS RAM map

Code	Description
00	Second
01	Second alarm
02	Minute
03	Minute alarm
04	Hour
05	Hour alarm
06	Day of the week
07	Day
08	Month
09	Year
0A	Status register A
0B	Status register B
0C	Status register C
0D	Status register D
0E	Diagnostic status byte
0F	Shutdown byte
10	Floppy disk drive type byte
11	Reserved
12	Hard disk type byte
13	Reserved
14	Equipment byte
15	Basic memory lower bytes
16	Basic memory higher bytes
17	Extended memory lower bytes
18	Extended memory higher bytes
30	Reserved for extended memory lower bytes
31	Reserved for extended memory higher bytes
32	Century byte
33	Information flag
34 to 3F	Reserved
40 to 7F	Reserved for chip-set setting data

Timer and DMA Channel Maps

Timer Channel Map

Table 7.4. Timer channel map

Timer Channel	Description
0	System timer interrupt
1	DRAM refresh request
2	Speaker tone generator

DMA Channel Map

Table 7.5. DMA channel map

DMA Channel	Description
0	Available
1	IBM SDLC
2	Floppy disk adapter
3	Channel 3 - available
4	DMA controller 1
5	Available
6	Available
7	Available

I/O and Memory Maps

Memory Map

Table 7.6. Memory map

Memory map	Description
0000000 to 009FFFF	System memory used by DOS and applications
00A0000 to 00BFFFF	Display buffer memory for the VGA/EGA/CGA/MONOCHROME adapter
00C0000 to 00C9FFF	VGA BIOS(40KB)
00CA000 to 00DFFFF	Reserved for the I/O device BIOS ROM or RAM buffer
00E0000 to 00EFFFF	Reserved for the PCI device ROM
00F0000 to 00FFFFF	System BIOS ROM
0100000 to BFFFFFF	System's extended memory

I/O Map

Table 7.7. I/O map

I/O map	Description
000 to 01F	DMA controller (master)
020 to 021	Interrupt controller (master)
022 to 023	Chip-set controller's register I/O port
040 to 05F	Timer control register
060 to 06F	Keyboard interface controller (8042)
070 to 07F	RTC port and CMOS I/O port
080 to 09F	DMA register
0A0 to 0BF	Interrupt controller (slave)
0C0 to 0DF	DMA controller (slave)
0F0 to 0FF	Math coprocessor
1F0 to 1F8	Hard disk controller
278 to 27F	Parallel port 2
2B0 to 2DF	Graphics adapter controller
2F8 to 2FF	Serial port 2
360 to 36F	Network port
378 to 37F	Parallel port 1
3B0 to 3BF	Monochrome and printer adapter
3C0 to 3CF	EGA adapter
3D0 to 3DF	CGA adapter
3F0 to 3F7	Floppy disk controller
3F8 to 3FF	Serial port 1

C. Troubleshooting

This appendix provides the overview of errors which are likely to occur while operating the system as well as tips for solving problems.

Error Messages

This section describes error messages and troubleshooting. According to the messages introduced in this section, adjust the system and verify that all components and connectors are installed at correct locations and securely connected. If an error persists, please contact the Contec Information Center.

Buzzer sounding at POST

The BIOS has two types of buzzer. One type of buzzer indicates that BIOS cannot initialize the video screen and cannot display any data due to a video error. This buzzer is comprised of one long sound followed by three short sounds. The other type of buzzer indicates that a DRAM error has occurred. This buzzer is comprised of one long sound which will be repeated.

CMOS BATTERY FAILURE

The CMOS battery is either not functioning normally or is depleted. Replace the entire unit.

CMOS CHECKSUM ERROR

The CMOS has been destroyed. A depleted battery could also be the cause of this message. Check the battery and replace it with a new battery, if necessary.

DISPLAY SWITCH IS SET INCORRECTLY

The display switch on the mother board can be set to either monochrome or color. This error message indicates that the setting of that switch is different from the setting specified with the Setup program. After checking to see which setting is correct, switch off the system and change the jumper or modify the VIDEO selection with the Setup program.

DISK BOOT FAILURE

If the boot device cannot be found, insert the system disk into drive A and press Enter. After verifying that all controllers and cables are at correct locations and that the disk is correctly formatted, restart the system.

DISKETTE DRIVES OR TYPES MISMATCH ERROR

The disk drive type is different from the definition in CMOS. Either run the Setup program once more or run the drive configuration process once more.

ERROR ENCOUNTERED INITIALIZING HARD DRIVE

The hard drive cannot be initialized. Verify that the corresponding adapter is correctly installed and all cables are correctly and securely connected. Also verify that the correct hard drive type is selected with the Setup program.

ERROR INITIALIZING HARD DISK CONTROLLER

If this error occurs, verify that the cord is connected to the bus correctly and securely. In addition, verify that the correct hard drive type is selected with the Setup program and all jumpers on the hard drive are set correctly.

FLOPPY DISK CONTROLLER ERROR OR NO CONTROLLER PRESENT

The floppy drive controller cannot be detected or initialized. Verify that the corresponding controller is configured correctly with the Setup program. If the floppy drive is not installed, make sure that Diskette Drive is set to NONE with the Setup program.

KEYBOARD ERROR OR NO KEYBOARD PRESENT

If this condition occurs, verify that the keyboard is connected correctly. Also verify that no key was pressed during booting. If the system is configured without a keyboard, set the condition to stop due to an error to HALT ON ALL, BUT KEYBOARD in the Setup program. If this is done, the BIOS will ignore that the keyboard is missing and continue to boot.

MEMORY ADDRESS ERROR

If this error occurs, check the reported location on the memory map. This allows you to identify and replace the defective memory chip.

MEMORY SIZE HAS CHANGED

Since the last time the system was booted, memory has been added or removed. If the system is in EISA mode, run the memory configuration process once more using the Configuration Utility. If the system is in ISA mode, specify the new memory size in the memory-related field using the Setup program.

MEMORY VERIFYING ERROR

An error has occurred while checking values written to the memory. Check the reported location on the system memory map. This allows you to identify the defective chip.

OFFENDING ADDRESS MISSING

If the segment that caused a problem cannot be identified, this message is displayed along with messages I/O CHANNEL CHECK and RAM PARITY ERROR.

REBOOT ERROR

If this error occurs, you need to restart the system. Press any key to restart the system.

SYSTEM HALTED

Since the current boot process has been aborted, you need to restart the system. Press the Del key while holding down the Ctrl and Alt keys.

POST Code

If the screen does not display any data when you turn on the PC, you need to insert the POST card to test the system. The ISA POST port address is 80h. Insert the POST card into the correct slot. The following is a list of error messages. Adjust the system according to instructions. If the error persists even after the adjustment, please contact the Contec Information Center.

C0: Turn off OEM-specific cache, shadow memory, etc.

03: Initialize all standard devices (including the following) to their defaults.

DMA controller (8237)

Programmable interrupt controller (8259)

Programmable interval timer (8254)

RTC chip

05: 1. Keyboard controller self-testing

2. Keyboard interface enabling

07: Verify the CMOS's basic R/W function.

BE: Set the chip set to its default values according to the default list for the MODBINable chip set.

C1: Auto-detect the onboard DRAM and cache.

C5: Copy the BIOS from ROM to the shadow RAM E0000-FFFF (to speed up the POST process).

08: Test the first 256KB of DRAM.

09: 1. Set up the Cyrix CPU configuration register according to the MODBINable Cyrix register table.

2. Initialize the OEM-specific cache (if necessary).

0A: 1. Initialize the first 32 interrupt vectors and set an appropriate interrupt handler.

Initialize 33-120 with a dummy interrupt handler.

2. Issue a CPUID instruction to check the CPU type.

3. Initialize the previous power conservation function (OEM-specific).

0B: 1. Check to see whether or not the RTC time is valid.

2. Detect a defective battery.

3. Read CMOS data into the BIOS stack area.

4. Initialize PnP including the following (only in the case of PnP BIOS):

- Assign CSN to the PnP ISA card.

- Create a resource map from ESCD.

5. Assign the PCI device's I/O and memory (only in the case of PCI BIOS).

0C: Initialize the BIOS data area (40:ON-40:FF).

OD: 1. According to the Setup program, set some values of the chip set (Early Setup Value Program).

2. Measure the CPU speed for display to determine the system clock speed.

3. Initialize video, such as monochrome, CGA, or EGA/VGA video. If a display device is not found, sound the buzzer.

OE: 1. Initialize APIC (only in the case of multi-processor BIOS).

2. Test the video RAM (if a monochrome display device is found).

3. Display the following messages:

- Award logo, copyright text, BIOS date code, and part number

- OEM-specific sign-on message

- Energy Star logo (only in the case of Green BIOS)

- CPU brand, type and speed

- System BIOS checksum test results (Non-compressed version only)

0F: Test DMA channel 0.

10: Test DMA channel 1.

11: Test the DMA page register.

14: Test 8254 timer 0 counter 2.

15: Test the 8259 interrupt mask bit of channel 1.

16: Test the 8259 interrupt mask bit of channel 2.

19: Test the 8259 function.

30: Detect the basic and extended memory sizes.

31: 1. Test the basic memory (256KB-640KB).

2. Test the extended memory (1MB-max. memory).

32: 1. Display the Award BIOS plug-and-play expansion message (only in the case of PnP BIOS).

2. According to Setup program values, program all onboard super I/O chips (if they exist), such as the COM, LPI and FDD ports.

3C: Set flags to allow the user to enter into the CMOS Setup utility.

3D: 1. Initialize the keyboard.

2. Install the PS2 mouse.

3E: Try enabling the level 2 cache.

Note!

Some chip sets may require enabling of L2 cache at this stage. However, the L2 cache is usually enabled later with POST 61h.

BF: 1. According to Setup program values, program the remaining chip sets (Later Setup Value Program).

2. If auto-setup is enabled, program chip sets using the values predefined in the MODBINable Auto-Table.

41: Initialize the floppy disk drive controller.

42: Initialize the hard drive controller.

43: In the case of PnP BIOS, initialize the serial and parallel ports.

45: Initialize the math coprocessor.

4E: If errors are detected (such as video and/or keyboard errors), display all error messages and wait for the user to press the F1 key.

4F: 1. Request to input a password if it is necessary.

2. Clear the Energy Star log (only in the case of Green BIOS).

50: Write all CMOS values that are currently stored in the BIOS stack area to CMOS once more.

52: 1. Initialize all ISA ROMs.

2. Do late PCI initialization (only in the case of PCI BIOS).

- Assign IRQ to PCI devices.

- Initialize all PCI ROMs.

3. Initialize PnP (only in the case of PnP BIOS).

- Assign I/O, memory, IRQ, and DMA to PnP ISA devices.
- Initialize all PnP ISA ROMs.

4. According to the Setup program values, program the shadow RAM.

5. According to the Setup program values, program parities.

6. Initialize the power management function.

- Enable/disable the global PM.
- Initialize the APM interface.

53: 1. If the BIOS is not PnP BIOS, initialize the serial and parallel ports.

2. Convert the RTC timer value into a timer tick value to initialize the time value in the BIOS data area.

60: According to the Setup program values, set up the antivirus function (to protect the boot sector).

61: 1. Try enabling the level 2 cache.

Notes!

- *This step is skipped if the L2 cache has already been enabled by POST-3D.*
- *According to the Setup program value, set the boot-up speed.*
- *The last chance to initialize chip sets.*
- *The last chance to initialize the power management function (only in the case of Green BIOS).*
- *Display the system configuration table.*

62: 1. According to the Setup program value, set daylight saving time.

2. According to the Setup program values, program NumLock, Typematic rate, and Typematic speed.

63: 1. If hardware configuration has been changed, update ESCD information (only in the case of PnP BIOS).

2. Clear the memory that has been used.

3. Start up the system by INT 19H.

FF: System startup. This indicates that BIOS has already passed control to the operating system.

A-46-094
LZJ7651
010122 [990920]